

**Example:**  $(4x + 7y)(9x^2 - 12xy - 4y^2)$

$$= (4x + 7y)(9x^2) + (4x + 7y)(-12xy) + (4x + 7y)(-4y^2)$$

$$= (4x)(9x^2) + (7y)(9x^2) + (4x)(-12xy) + (7y)(-12xy) + (4x)(-4y^2) + (7y)(-4y^2)$$

$$= 36x^3 + 63x^2y - 48x^2y - 84xy^2 - 16xy^2 - 28y^3$$

$$= 36x^3 + 15x^2y - 100xy^2 - 28y^3$$

**Example:**  $(3x - 5)^2 = (3x - 5)(3x - 5)$

$$= (3x)(3x - 5) + (-5)(3x - 5)$$

$$= 9x^2 - 15x - 15x + 25$$

$$= 9x^2 - 30x + 25$$

**Example:**  $(3x - 5)^3 = (3x - 5)(3x - 5)^2$

We make use of the answer from the previous problem:

$$= (3x - 5)(9x^2 - 30x + 25)$$

$$= (3x)(9x^2 - 30x + 25) + (-5)(9x^2 - 30x + 25)$$

$$= (3x)(9x^2) + (3x)(-30x) + (3x)(25) + (-5)(9x^2) + (-5)(-30x) + (-5)(25)$$

$$= 27x^3 - 90x^2 + 75x - 45x^2 + 150x - 125$$

$$= 27x^3 - 135x^2 + 225x - 125$$